MANUAL OF SAMPLING AND STATISTICAL METHODS FOR FISHERIES BIOLOGY

PART 1. SAMPLING METHODS

by

J.A. GULLAND

Fisheries Laboratory
Lowestoft, England

Foreword

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FIb/M1 Manual of methods in fisheries biology.

FRs/M3 Manual of sampling and statistical methods for fisheries biology. Part 1. Sampling methods. Sections 1 - 4.

In provisional edition

FB/M2 Manual of fisheries science.

FIb/T26 Suppl. 1 Manual of sampling and statistical methods for fisheries biology. Part 2. Statistical methods. Section 5. Computations.

FIb/T40 Manual of methods for fish stock assessment. Part 1. Population analysis.

FIb/T38 Manual of methods for fish stock assessment. Part 2. Tables of yield functions.

FIb/T41 Manual of methods for fish stock assessment. Part 3. Selectivity of fishing gears.

FIb/T51 Manual of methods for fish stock assessment. Part 4. Report on marking.

In preparation

Manual of sampling and statistical methods for fisheries biology. Part 2. Statistical methods. Section 6 *et seq.*

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FOREWORD

Several years ago, at one of the earliest sessions of the Indo-Pacific Fisheries Council, attention was drawn to the need for textbooks covering each of the aspects of fisheries science. Plans were then made for a series of manuals for the use of fishery workers in the Indo-Pacific region. Progress in preparing these was for several reasons very slow. In the meantime, the Food and Agriculture Organization of the United Nations had found through its Expanded Program of Technical Assistance, its experience in conducting regional training centers and, more recently, as Executing Agency of fisheries projects under the Special Fund sector of the United Nations Development Program, that the need for such manuals extended beyond the Indo-Pacific region. The Organization therefore undertook to sponsor the production of such a series for worldwide use.

There can be no doubt about the need for manuals such as those planned. Fisheries science is new, its academic institutions few, and its practitioners far from numerous. It is natural therefore that few efforts should have been made to crystallize, in textbook language, ideas and concepts that are even now still taking shape. Nor does FAO wish to be premature in this matter, and these manuals will therefore not be textbooks in the usual sense, but rather practical guides describing techniques and plans and presenting such ideas and views on this science as at present have general currency. In doing this we have borne in mind that very frequently the original scientific publications in which methods are described may not all be available to the technicians and research workers for whom these manuals are intended, especially in developing countries: and also that although many of the methods for particular purposes — especially in oceanography — are more fully described in a number of existing manuals, these also are not always accessible, nor published in a language readily understood by the users.

An unusual feature of this and other manuals in the FAO series will be the combination of descriptions of methods for both inland and marine investigations: this, we believe, will prove especially useful in developing countries, where the very few trained people may be called upon from time to time to make *ad hoc* studies outside their own special competence.

The production of these manuals is a co-operative enterprise in which authors, consultants and users are joined together in deciding which concepts, methods and terms have survived sufficient testing to merit inclusion. Because fisheries science is growing rapidly, the manuals are

issued in separate fascicules to allow for ready revision of individual sections.

The assistance of all fishery workers in the task of revision is sought, and comments and suggestions from readers would be welcomed.

Compilation and publication in three languages of technical manuals such as these is necessarily a lengthy process. Since work on them was begun the Inter-Governmental Oceanographic Commission under Unesco, and the Scientific Committee for Oceanic Research of the International Council of Scientific Unions have both come into existence, and the Unesco Office of Oceanography, the International Council for the Exploration of the Sea and other international bodies have, through specialized working groups and by other means, begun studies to review many oceanographic methods and to propose standards for them. It may well be, therefore, that several of the methods originally proposed for inclusion in this manual will soon be superseded. Nevertheless, at the time of going to press the methods described in each volume are believed to be useful ones, even if some are not entirely satisfactory.

ROY I. JACKSON

Assistant Director-General,
Department of Fisheries

NOTE

The origin and scope of the series *FAO Manuals in Fisheries Science* are described in the foreword. Part 1 of the present volume, comprised of the first four sections of the entire manual, deals with sampling methods. It is a revision of *FAO Fisheries Biology Technical Paper* No. 26 which was issued in October 1962 as a provisional English version only. That in turn was an expanded version of J.A. Gulland (1957) *FAO fish. Bull.*, 10(4): 157-181 (published in English, French and Spanish), revised on the basis of the author's experience at an FAO/EPTA Training Center on the Methodology and Techniques of Research on Mackerel (*Rastrelliger*), held at Bangkok, Thailand, in 1958, and at the Training Course on Fish Population Dynamics at Lowestoft, England in 1957. Technical Paper No. 26, which was prepared at the request of the Indo-Pacific Fisheries Council (Karachi meeting, 1960) was used at seminars given by the author in Australia in 1962 and 1964, at the second Training Course of Fish Stock Assessment, sponsored by the International Council for the Exploration of the Sea (ICES) and held at Lowestoft in 1963, and at the FAO/EPTA Training Center on Research on Tunas and Mackerels, in Australia in 1964. The present version incorporates amendments based on this experience, and on numerous comments received from correspondents. Although applicable in principle also to inland fisheries, the methods described and the examples given relate primarily to marine investigations.

Part 2 of this manual dealing with statistical methods will consist of a series of fascicules, each a section by a particular author and dealing with a method useful in fisheries biology, with worked examples. Preparation of these sections is a co-operative project of FAO and ICES for which a joint Editorial Group, under the leadership of Mr. J.A. Pope, is responsible. The plans and procedures for publishing them are described in the provisional version of Section 5 (Computations, by K.P. Anderson) issued in 1965 as *FAO Fisheries Technical Paper* No. 26, Suppl. 1.

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